

TRANSLATION

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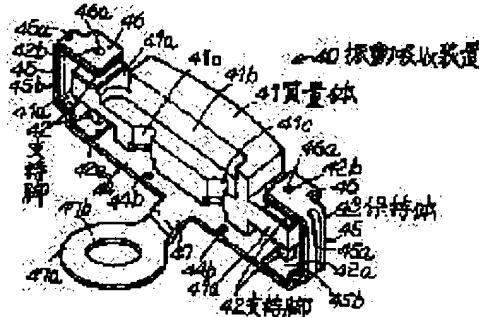
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(54) OSCILLATION ABSORBING DEVICE FOR STEERING WHEEL

(57) Abstract:

PURPOSE: To efficiently absorb oscillation of a steering wheel and to miniaturize a boss part.

CONSTITUTION: An air bag device and an oscillation absorbing device 40 are furnished on a boss part of a steering wheel main body. The oscillation absorbing device 40 has a slender mass body 41, and the neighbourhood of both ends of this mass body 41 is respectively sandwiched by rubber made support legs 42. These support legs 42 are adhered on a holding body 43, and the mass body 41 is elastically supported free to move. Consequently, it is possible to easily arrange the mass body 41 in the circumference of the air bag device. The mass body 41 moves in parallel and efficiency of oscillation absorption is improved.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the oscillating absorber of the steering wheel with which the boss section of the steering wheel of an automobile is equipped.

[0002]

[Description of the Prior Art] The oscillating absorber of the steering wheel indicated by the former, for example, JP,2-34468,A, is known. The steering wheel with which it is equipped with the oscillating absorber of this steering wheel has the spoke section which connects the rim section which makes the shape of a circular ring, the boss sections located inside this rim section, and these rim sections and boss sections. And the boss attached in a steering shaft is prepared in this boss section, and while the boss plate which rodging of the spoke section etc. fixes to this boss has fixed, the crew side of this boss plate is covered with the covering object which makes box-like.

[0003] Moreover, this oscillating absorber has the base plate fixed to a boss plate by sticking, and the pyramid of medulla oblongata which makes abbreviation rectangle tabular, and is connected by four support saddles in which the four corners of these base plates and pyramids of medulla oblongata have elasticity.

[0004] And this oscillating absorber controls vibration of a steering wheel, when a steering wheel vibrates, and the pyramid of medulla oblongata supported elastically moves in the shape of abbreviation parallel.

[0005]

[Problem(s) to be Solved by the Invention] By the way, actuation switches, such as audio equipment besides a horn switch, air bag equipment, etc. may be contained, and since especially air bag equipment is equipped with the inflator which injects gas, the folded-up air bag, it needs big space for the boss section of a steering wheel.

[0006] However, since this oscillating absorber also needs big space when the four corners of the pyramid of medulla oblongata and base plate which make abbreviation rectangle tabular are connected by four support saddles like above-mentioned before and an oscillating absorber is constituted, it has the problem that the boss section of a steering wheel is enlarged.

[0007] This invention aims at offering the oscillating absorber of the steering wheel which can absorb vibration of a steering wheel efficiently while it was made in view of such a point and being able to arrange it in small space.

[0008]

[Means for Solving the Problem] The oscillating absorber of the steering wheel of this invention possesses the mass object which makes an elongated shape, the support saddle with which the abbreviation shaft orientations of said steering shaft were equipped by carrying out phase opposite near the both ends of the longitudinal direction of this mass object, respectively and in which elastic deformation is possible, and the supporter holding these support saddles in the oscillating absorber of the steering wheel with which the body of a steering wheel with which a steering shaft is equipped is equipped.

[0009]

[Function] With the oscillating absorber of the steering wheel of this invention, where a supporter is

attached in the body of a steering wheel, if this body of a steering wheel vibrates, the mass object supported by the support saddle in which elastic deformation is possible will move, and vibration of the body of a steering wheel will be absorbed. And since the mass object which makes an elongated shape is supported by the support saddle with which the abbreviation shaft orientations of a steering shaft were equipped by carrying out phase opposite near the both ends of a longitudinal direction, respectively and in which elastic deformation is possible, it vibrates in the direction which intersects perpendicularly with the shaft orientations of a steering shaft mostly, the migration to the direction of torsion, the inclining direction is controlled, and it absorbs vibration efficiently.

[0010]

[Example] Hereafter, the configuration of one example of the oscillating absorber of the steering wheel of this invention is explained with reference to a drawing.

[0011] In drawing 2 and drawing 3 , 11 is the body of a steering wheel of an automobile, and this body 11 of a steering wheel has the rim section 12 which makes the shape of a circular ring, the boss section 14 located inside this rim section 12, and two or more spoke sections 15 which connect these rim sections 12 and the boss section 14.

[0012] And it is arranged rather than the core of the rim section 12 in the location which shifted to the bottom a little, big opening is formed in the top section of the boss section 14, and the boss section 14 is easy to check by looking meter, such as a rate form prepared in the instrument panel.

[0013] Moreover, attachment hole 17a attached in the car side of the boss section 14 at a steering shaft 16 The boss 17 of the shape of a formed cylinder is formed, and this boss 17 has become the center of rotation of the body 11 of a steering wheel. And while the boss plate 18 is joined by this boss 17 by welding etc., in this boss plate 18, it is rodding 15a of each spoke section 15. It is joined by welding etc. moreover, rodging 15a located in the bottom **** -- horn switching equipment 19 is attached, respectively and the horn carbon button 20 is attached in the crew side of each horn switching equipment 19. And the car side of this boss section 14 is covered with the lower covering 21.

[0014] Moreover, the crew side of the boss section 14 is equipped with air bag equipment 23. This air bag equipment 23 has the base plate 25 which makes the shape of a front view abbreviation rectangle attached in the boss plate 18 through the bracket which is not illustrated, and while the inflator (gas generator) 26 which makes the shape of an approximate circle column in the abbreviation center section of this base plate 25 is being fixed, the air bag 27 which makes saccate is attached in the crew side of this base plate 25. And the interior is filled up with a propellant and this inflator 26 injects gas, such as nitrogen gas, rapidly by burning this propellant. Moreover, as an air bag 27 covers the crew side of an inflator 26, it is folded up small, using the retainer 28 which makes annular, sticks near the opening edge to a base plate 25, and is being fixed.

[0015] And as a crew's side, such as these inflators 26 and an air bag 27, is covered, the covering object 31 which makes the abbreviation box-like which carried out opening of the car side is attached. The brittle break line 33 with which this covering object 31 makes the letter of the front view abbreviation for H characters while the insertion object 32 is laid under the interior is formed. And the periphery section is in the condition which equipped the boss section 14 with air bag equipment 23 while being supported by the base plate 25, and, as for this covering object 31, the lower limit section of a periphery contacts the lower covering 21.

[0016] Moreover, the center of gravity of this air bag equipment 23 is mostly located at the core of an inflator 26, and since the boss section 14 shifts to the rim section 12 bottom and is arranged, the center of gravity of this air bag equipment 23 also shifts below the center of rotation of the body 11 of a steering wheel, and it is located.

[0017] And this air bag equipment 23 protects crew from an impact by blowing off, expanding gas rapidly, an inflator's 26 fracturing the covering object 31 to the interior of an air bag 27 from the break line 33 with the pressure of this expansion, developing it in the cases, such as a collision of an automobile, and making crew's front face carry out expansion expansion of the air bag 27.

[0018] Moreover, except for the space where the nut 35 screwed in the point of a steering shaft 16 is arranged between the boss plate 18 and a base plate 25, the electrical parts 36, such as a control device of air bag equipment 23 and a control device of audio equipment, are contained.

[0019] Furthermore, the oscillating absorber 40 is attached in the upper part by the side of the crew of

the boss plate 18, and this oscillating absorber 40 consists of supporters 43 holding the mass objects 41, such as a product made of cast iron, four support saddles 42 with which this mass object 41 was equipped, and these support saddles 42 etc.

[0020] And this mass object 41 is arranged along with the upper limit section of nothing and the boss section 14 in the elongated shape which makes the direction of both sides a longitudinal direction. Moreover, this mass object 41 is support plate section 41a which makes tabular from the both ends of a longitudinal direction while the top section is formed in the shape of radii in accordance with the configuration of the boss section 14, and 41a. It protrudes and they are such support plate section 41a and 41a. To the crew and car side, the support saddle 42 has fixed almost in parallel with the shaft orientations of a steering shaft 16, respectively. And these support saddles 42 are flange 42a which makes rectangle tabular to the both ends of a longitudinal direction, respectively while being formed in the shape of the abbreviation square pole with the ingredient in which elastic deformation, such as rubber, is possible. It is formed and is flange 42a of the end section, respectively. Vulcanization adhesion etc. is carried out and it is support plate section 41a. It has fixed in one.

[0021] Moreover, while the substrate section 44 prepared along with the bottom section of the mass object 41 is formed in the supporter 43 To the both ends of this substrate section 44, it is support plate section 41a of the mass object 41. The maintenance arms 45 and 45 crooked in cross-section abbreviation horseshoe-shaped as covered are formed. Maintenance Itabe 46 and 46 of the both-sides pair which carries out phase opposite near the both ends of the substrate section 44, respectively is formed in the point of these maintenance arms 45 and 45. Furthermore, from the abbreviation center section of the substrate section 44, the fixed piece section 47 is installed toward the cross direction.

[0022] And it is support plate section 41a of the mass object 41 to maintenance Itabe 46 and 46 of both sides near the both ends of the substrate section 44. Flange 42a prepared in the other end of the support saddle 42 which fixed the end section Vulcanization adhesion etc. was carried out, respectively and it has fixed in one. Moreover, phase opposite is carried out at these substrate section 44 and maintenance Itabe 46 and 46, respectively, and they are engagement hole 44a and 46a. It is formed and they are such engagement hole 44a and 46a. Engagement projected part 42b which protruded from the edge of each support saddle 42 It has fixed in the condition of being engaged.

[0023] Thus, the mass object 41 is elastically supported movable through a support saddle 42 inside a supporter 43, and the so-called tuned damper is constituted.

[0024] Moreover, the maintenance arm 45 of both sides is met at a longitudinal direction, respectively, and it is crevice 45a. Covering 45b which becomes a support saddle 42, one, or another object from elastic bodies, such as rubber, etc. at a medial surface while crookedness formation is carried out and reinforcement is raised It is formed, and even if the mass object 41 moves and it contacts the maintenance arm 45, an allophone etc. occurs.

[0025] Moreover, two or more through-hole [section / 44 / substrate] 44b It is formed and is these through-hole 44b. The supporter 43 is being stuck and fixed to the boss plate 18 with the mounting bolt 48 which minds and is screwed in the boss plate 18.

[0026] Furthermore, fastening part 47a which makes annular to the point of the fixed piece section 47 It is formed and is this fastening part 47a. To a center section, it is a boss's 17 attachment hole 17a. Through-hole 47b open for free passage It is formed. And the fixed piece section 47 of this supporter 43 is stuck and fixed to the boss plate 18 with the nut 51 screwed in the steering shaft 16 attached in this boss 17, and the oscillating absorber 40 is attached in the body 11 of a steering wheel.

[0027] In addition, crevice 41b for avoiding contact to the inflator 26 of air bag equipment 23 on the mass object 41 Two or more notch 41c for making screwing of a mounting bolt 48 easy It is formed.

[0028] Moreover, the center of gravity of this oscillating absorber 40 is shifted and located above the center of rotation of the body 11 of a steering wheel, faces across this center of rotation, and is located in the opposite side of the center of gravity of air bag equipment 23.

[0029] And according to this example, where the body 11 of a steering wheel is joined by vibration, the mass object 41 supported by the support saddle 42 in which the elastic deformation of the oscillating absorber 40 is possible can move, and vibration of the body 11 of a steering wheel can be absorbed and controlled.

[0030] Moreover, since the small space between air bag equipment 23 and the boss plate 18 can be

equipped with it since the mass object 41 is formed in the elongated shape, and the space inside the boss section 14 of the body 11 of a steering wheel can be used effectively, this boss section 14 can be miniaturized.

[0031] Furthermore, since the mass object 41 which makes this elongated shape is supported near the both ends of a longitudinal direction after having been pinched by the support saddle 42 from the car and crew side, respectively, it can vibrate in the direction which intersects perpendicularly with the shaft orientations of a steering shaft 16 mostly, and can absorb vibration of the body 11 of a steering wheel efficiently. namely, in fixing a support saddle 42 to the 1 side of the both ends of the mass object 41 which makes an elongated shape and supporting the mass object 41 by these two support saddles 42 For example, although the so-called loss factor occurs and the effectiveness of oscillating absorption falls by the mass object's 41 rotating the direction which intersects perpendicularly with a longitudinal direction in the direction of torsion made into shaft orientations, or rotating the direction in alignment with a longitudinal direction in the direction which inclines as shaft orientations etc. Since the mass object 41 of this example is supported after having been pinched by the support saddle 42 from the car and crew side, respectively, it can make it move near the both ends of a longitudinal direction in the shape of parallel mostly to the boss plate 18. Then, when the body 11 of a steering wheel vibrates in the shape of parallel mostly to the boss plate 18 especially, while vibration of the body 11 of a steering wheel is efficiently absorbable, a useless motion of the mass object 41 is controlled by migration of this mass object 41, and it can control that the mass object 41 generates an allophone in contact with other components contained inside the boss section 14 etc. by it.

[0032] The air bag equipment 23 and the oscillating absorber 40 which have weight centering on the center of rotation of the body 11 of a steering wheel, respectively are shifted and located in the opposite side. Furthermore, the center of gravity of air bag equipment 23, Since the center of gravity of the oscillating absorber 40 was located in the opposite side, the center of gravity of the whole steering wheel is made in agreement with the center of rotation of the body 11 of a steering wheel. Or since the center of gravity of the whole steering wheel can be made to approach the center-of-rotation side of the body 11 of a steering wheel rather than the center of gravity of air bag equipment 23 at least, While being able to decrease the moment of inertia at the time of carrying out rotation actuation of the steering wheel, control-force fluctuation can be lessened.

[0033] In addition, in the above-mentioned example, although the support saddle 42 was formed in the abbreviation square pole configuration, for example by forming in the shape of an approximate circle column, to all the directions that make the letter of parallel to the boss plate 18, the mass object 41 can be moved similarly and the same resonance frequency property can be acquired.

[0034] Moreover, in the above-mentioned example, although the mass object 41 has been arranged along with the top section of the boss section 14, since this mass object 41 makes an elongated shape, it can make it easy to be also able to arrange along with the bottom section side of the boss section 14, or an upper-and-lower-sides side, or to arrange along with one flank of the boss section 14, or the both-sides section etc., and it can raise the degree of freedom of components arrangement of the boss section 14 interior.

[0035]

[Effect of the Invention] According to the oscillating absorber of the steering wheel of this invention, since a mass object makes an elongated shape, small space can be equipped with it and it can use the space inside a steering wheel effectively. And since the mass object which makes this elongated shape is supported by the support saddle with which the abbreviation shaft orientations of a steering shaft were equipped by carrying out phase opposite near the both ends of a longitudinal direction, respectively and in which elastic deformation is possible, it vibrates to the shaft orientations of a steering shaft in the direction which carries out an abbreviation rectangular cross, the migration to the direction of torsion, the inclining direction is controlled, and it can absorb vibration efficiently.

[Translation done.]